



June 3, 2004

## SWEETWATER AUTHORITY

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Mr. John Robertus, Executive Officer  
California Regional Water Quality Control Board – San Diego Region  
9174 Sky Park Court, Suite 100  
San Diego, California 92123-4340

Ref: IC: 02-0858-02 richp

Subject: TENTATIVE ORDER NO. R9-2004-011  
Request to Perform Copper Translator Study

Dear Mr. Robertus:

Sweetwater Authority staff has finished their review of tentative Order No. R9-2004-011. The Authority has concerns about meeting the new effluent limitation for total recoverable copper determined by using the CTR conversion factor (translator). The fact sheet for the Order allows that the discharger may request to conduct a *Metals Translator Study* to determine a site-specific translator for copper in the discharge.

Sweetwater Authority is willing to commit to completing a statistically defensible site-specific translator study and share the results of the study with the Board including proposing a new dissolved to total recoverable translator for copper.

Attached is an outline of the work plan for the proposed study. If the Regional Board finds this acceptable, Sweetwater Authority will provide a final work plan within three months.

If you have any questions regarding this matter, please contact Don Thomson, Water Quality Superintendent for Sweetwater Authority at (619) 409-6802 or email at [dthomson@sweetwater.org](mailto:dthomson@sweetwater.org)

Sincerely,

SWEETWATER AUTHORITY

Mary Ann Mann, P.E.  
Director of Water Quality

Attachment

SAN DIEGO REGIONAL  
WATER QUALITY  
CONTROL BOARD  
2004 JUN -3 A 8:57



## TECHNICAL MEMORANDUM

Water Quality & Treatment Solutions, Inc.  
An Environmental Engineering & Science Consulting Company

www.wqts.com

**Date:** June 2, 2004

**To:** Ms. Mary Ann Mann, P.E.  
Director of Water Quality  
Sweetwater Authority

**WQTS Project No.:** 0024.0020

**From:** Issam Najm, Ph.D., P.E.

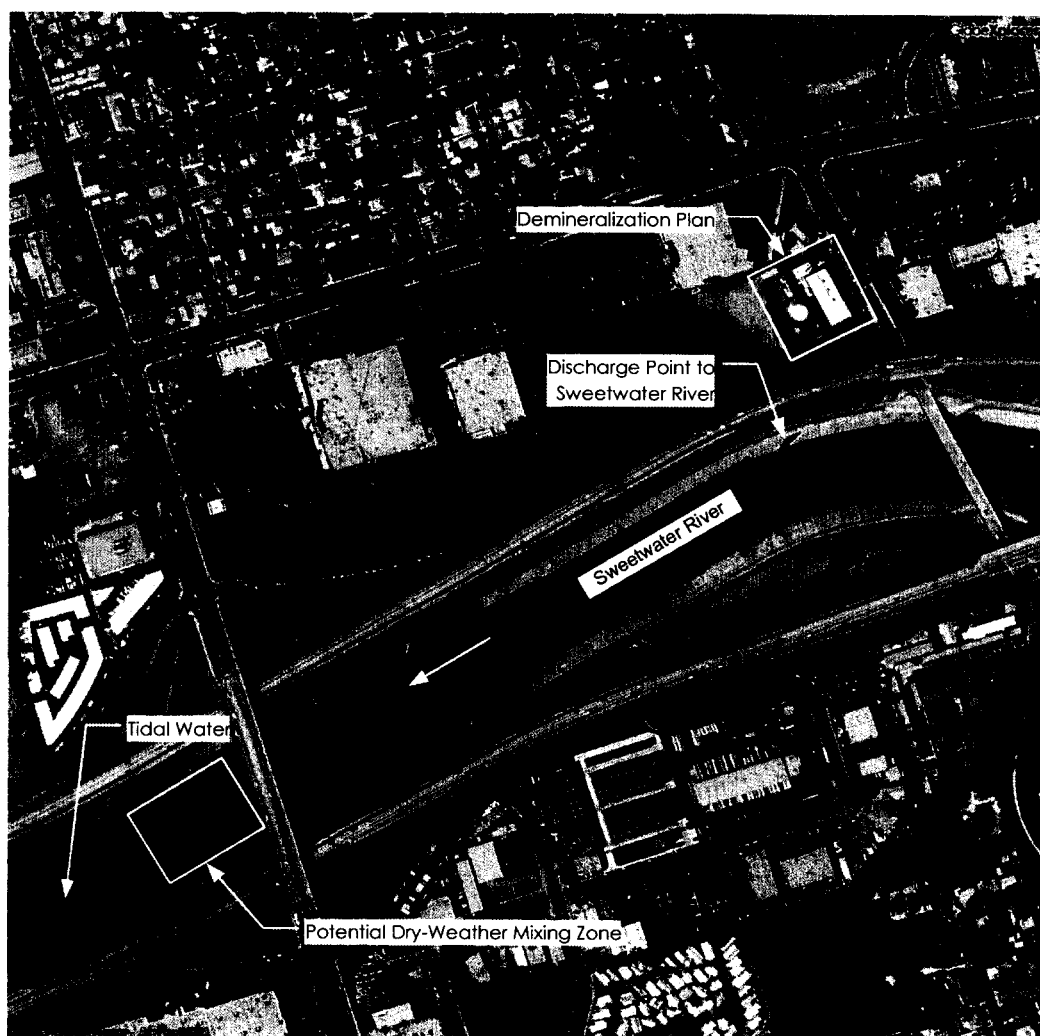
**Project:** Copper Translator Study for the Brackish Water Demineralization Plant Discharge  
**Ref: IC: 020858.02: richp**

**Re:** Preliminary Translator Study Plan

In response to a request from the Regional Water Quality Control Board (RWQCB), Sweetwater Authority (SWA) will conduct a translator study to determine a site-specific translator for copper concentration in the discharge from SWA's brackish-water demineralization plant. This Technical Memorandum (TM) represents a preliminary plan for the translator study for inclusion with the permit application. A more detailed plan will be prepared within three months after receipt of the interim permit from the RWQCB. The detailed plan will then be submitted to the RWQCB for approval before it is implemented. The translator study aims at gathering statistically reliable data that allow for the determination of a revised maximum total recoverable copper level in the demineralization plant discharge. The various elements of the study will be based on four primary documents:

1. *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Phase 1 of the Inland Surface Water Plan and the Enclosed Bays Estuaries Plan)*, State Water Resources Control Board, California Environmental Protection Agency (2000).
2. *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criterion*. US Environmental Protection Agency, EPA 823-B-96-007 (June, 1996)
3. *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*. US Environmental Protection Agency, (July 1996).
4. Federal Register. *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule*. Environmental Protection Agency, 30 CFR, Part 131, May 18, 2000.

Figure 1 shows an aerial photograph of the demineralization plant and the location of its discharge point into the Sweetwater River. During dry weather season, there is typically no fresh-water flow in Sweetwater River, and the discharge directly impacts the tidal water from the bay. During the wet season, fresh water flow in the Sweetwater River dilutes the discharge before it reaches the tidal water region and eventually the bay. Based on the clear difference between the dry-weather condition (no River flow) and the wet-weather condition (with River flow), we propose to conduct the translator study under these two separate conditions. We are assuming that the discharge limit will be based on meeting the acute and chronic water quality criteria for saltwater, and not those for fresh water since the total recoverable copper levels in the discharge are currently below the fresh-water chronic and acute levels. Therefore, the sampling plan for this translator study will focus on the tidal water, and not the seasonal fresh water in the River.



**Figure 1 – Project Location**

## **OVERALL SAMPLING APPROACH**

For each condition (i.e., wet-weather or dry-weather conditions), we will collect monthly samples over a three-month period. This section describes the information to be gathered, including the sampling locations, number of samples to be collected from each location, and the parameters for which these samples will be analyzed.

**Preliminary Data & Water Quality Analyses** – Prior to the collection of the translator study samples, it will be important to review various pieces of information relating to tidal movement, Sweetwater River flow, fluctuations in discharge quantity and quality, and review of available historical water quality information from bay water and from Sweetwater River water. This information may result in significant modifications to the test plan. In addition, preliminary water quality samples should be collected from various locations in the tidal zone and the bay, and analyzed for dissolved and total recoverable copper concentrations, as well as pH, hardness,

and salinity. This information will be important to help improve the chances of success of the study. For example, if the total and/or dissolved copper concentrations in the bay are below detection, it will be difficult to calculate the copper translator. This finding may cause us to modify the entire sampling plan and/or the means by which the translator is calculated.

**Identification of Mixing Zone(s)** – During dry-weather conditions (such as that shown in Figure 1), the beginning of the tidal water region is very clear. The discharge water flows through the dry riverbed until it reaches the tidal water (the distance in Figure 1 is approximately 600 yards from the discharge point). During high tide, this distance may be as short as 50 yards. An initial sampling program will be conducted to define the dry-weather mixing zone using the criterion defined by RWQCB (2000). Once the mixing zone is defined (if any), the translator samples will then be collected at the edge of this zone. If no mixing zone can be defined, the translator samples will be collected at the beginning of the tidal water zone, which will be defined as that at which the salinity of the water exceeds 10 part-per-thousand (or approximately 10,000 mg/L). This criterion is based on the California Toxics Rule (Federal Register, 2000).

During wet-weather conditions when fresh water is flowing through the Sweetwater River, a similar initial sampling program will be conducted to define the beginning of the saline water zone based on the CTR criterion of 10,000 mg/L. It is then reasonable to assume that the beginning of the saline zone is the edge of the wet-weather mixing zone. The wet-weather translator samples will then be collected at that location.

**Translator Samples** – During each of the three months of sampling, we propose to collect four (4) samples from the edge of the mixing zone as defined above for a total of 12 samples per weather condition. These samples will be analyzed for total recoverable and dissolved copper concentrations, as well as pH, TSS, conductivity, and total hardness. The sampling and QA/QC procedures implemented will, to the extent possible, conform to EPA sampling method 1669 (EPA, 1996).

**Background Samples** – During each of the three months of sampling, we propose to collect four (4) samples from a tidal-water location minimally impacted by the discharge for a total of 12 samples under each weather condition. The samples will be located from the middle of the bay where the discharge dilution factor is certain to be greater than 100:1. The samples will be analyzed for dissolved and total recoverable copper. The samples will also be analyzed for pH, TSS, conductivity, and total hardness. The sampling and QA/QC procedures implemented will, to the extent possible, conform to EPA sampling method 1669 (EPA, 1996).

## **ANALYTICAL METHOD**

Copper samples will be analyzed by a contract laboratory using the ICP/MS analytical method. However, due to the high sodium concentration anticipated in the tidal samples, there is a strong potential for a false-positive effect of a sodium-argon complex that has been documented by the United States Geological Survey (Faires, 1993).<sup>1</sup> Therefore, an appropriate QA/QC plan will be developed and implemented to identify and eliminate this interference before any study samples are analyzed.

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<sup>1</sup> Faires L.M., 1993, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory-- Determination of metals in water by inductively coupled plasma-mass spectrometry: U.S. Geological Survey Open-File Report 92-634, 28 p. (Method ID: I-2477-92).

## **CALCULATION & REPORTING OF THE TRANSLATOR(S)**

The dissolved and total recoverable copper samples collected from the edge of the mixing zone(s) during dry-weather and wet-weather sampling events will be utilized to calculate the translator values. For translation of chronic criteria, the media of the 12 ratios of dissolved-to-total copper concentrations will be used. For translation of acute criteria, the 95<sup>th</sup> percentile of the 12 ratios will be used. This is the approach described by EPA's metals translator guidance document.

At the end of the study, a detailed study report will be submitted to the RWQCB for review and approval. In addition to the proposed translator(s), the report will include all the raw data collected, the results of the QC samples, the experimental procedures followed, and the analysis conducted to develop the translator(s). The report will also include the results of the background samples and general water quality parameters analyzed during the study.